

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 January 2004 (15.01.2004)

PCT

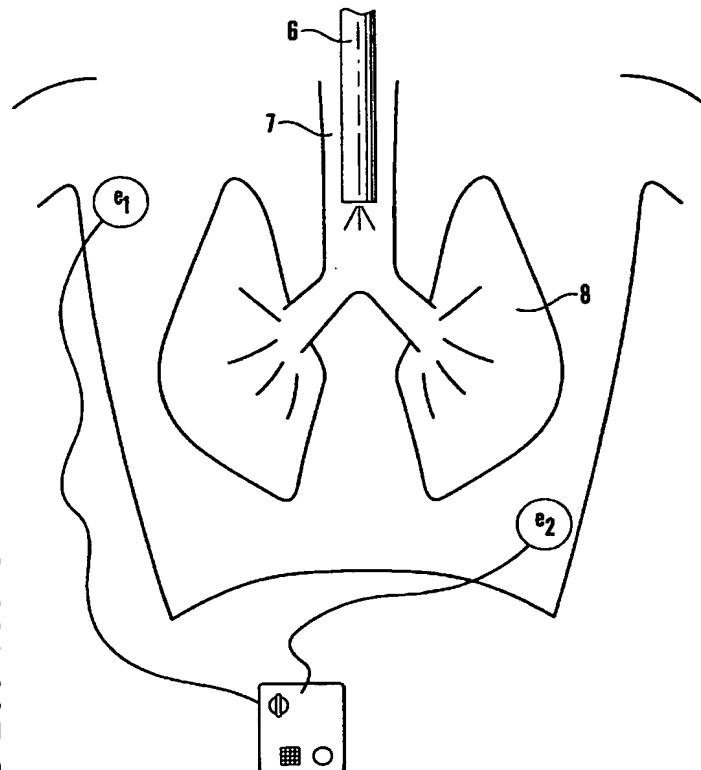
(10) International Publication Number  
**WO 2004/004541 A3**

- (51) International Patent Classification<sup>7</sup>: **A61B 5/053**, A61M 16/04
- (21) International Application Number: PCT/NO2003/000208
- (22) International Filing Date: 19 June 2003 (19.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
20022960 19 June 2002 (19.06.2002) NO  
60/390,115 21 June 2002 (21.06.2002) US
- (71) Applicant (for all designated States except US): **MEDIN-NOVA SF** [NO/NO]; Rikshospitalet, N-0027 OSLO (NO).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **WIK, Lars** [NO/NO]; Bestumveien 31, N-0281 OSLO (NO).
- (74) Agent: **ONSAGERS AS**; P.O. Box 6963 St. Olavs plass, N-0130 OSLO (NO).
- (81) Designated States (*national*): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

[Continued on next page]

(54) Title: INTUBATION MONITORING APPARATUS AND METHOD

(57) Abstract: The invention comprises an apparatus and a method for externally assessing and monitoring placement of an endo-tracheal tube for ventilation of patients based on thoracic impedance measurement.





SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Declaration under Rule 4.17:**

— *of inventorship (Rule 4.17(iv)) for US only*

**(88) Date of publication of the international search report:**

10 June 2004

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NO 03/00208

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61B5/053 A61M16/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EP0-Internal, WPI Data, PAJ, INSPEC

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 403 215 A (TAAKS HERMANN ET AL) 6 September 1983 (1983-09-06) column 2, line 48 -column 4, line 35	1,5,6,8, 10,11
Y	---	2,3,9 4,7,12
A	US 2002/032383 A1 (BISERA JOE ET AL) 14 March 2002 (2002-03-14) abstract; figures 1,3	3,9
Y	---	1,2,4-8, 10-14
A	EP 0 747 005 A (INSTRUMENTARIUM OY) 11 December 1996 (1996-12-11) column 1, line 45 -column 3, line 58	2
Y	---	1,3-13
A	FR 2 652 255 A (CENTRE NAT RECH SCIENT) 29 March 1991 (1991-03-29) the whole document	1-14

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

11 March 2004

Date of mailing of the international search report

20 APR. 2004

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

BO GUSTAVSSON

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NO 03/00208

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61B5/053 A61M16/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 403 215 A (TAAKS HERMANN ET AL) 6 September 1983 (1983-09-06) column 2, line 48 -column 4, line 35	1,5,6,8, 10,11
Y		2,3,9
A		4,7,12
Y	US 2002/032383 A1 (BISERA JOE ET AL) 14 March 2002 (2002-03-14) abstract; figures 1,3	3,9
A		1,2,4-8, 10-14
Y	EP 0 747 005 A (INSTRUMENTARIUM OY) 11 December 1996 (1996-12-11) column 1, line 45 -column 3, line 58	2
A		1,3-13
A	FR 2 652 255 A (CENTRE NAT RECH SCIENT) 29 March 1991 (1991-03-29) the whole document	1-14

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

11 March 2004

Date of mailing of the international search report

20 APR. 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

BO GUSTAVSSON

# INTERNATIONAL SEARCH REPORT

In application No.  
PCT/NO 03/00208

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 10-14  
because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Claims Nos.: 10-14

Claims 10-14 relate to methods of treatment of the human or animal body by surgery or by therapy/diagnostic methods practised on a human or animal body/Rule 39.1.(iv). Nevertheless, a search has been executed for claims 10-14 based on the alleged effects of the compound/compositions/product/device.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter-Office Communication No.

PCT/NO 03/00208

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4403215	A	06-09-1983	NONE	
US 2002032383	A1	14-03-2002	NONE	
EP 0747005	A	11-12-1996	FI 952587 A EP 0747005 A1	27-11-1996 11-12-1996
FR 2652255	A	29-03-1991	FR 2652255 A1	29-03-1991